What is claimed

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1.   A system for discovering and mapping a digital network, the system comprising:

    a controller adapted to generate a transport stream map in response to received network messages; and

    a plurality of devices in communication with the controller, each of the devices adapted to receive at least one transport stream, monitor the received at least one transport stream, and respond to changes in the received at least one transports stream by generating a network message and sending the network message to the controller.

2.   The system of claim 1, wherein the controller sends an initiate mapping message to the plurality of devices and multiple devices of the plurality of devices respond thereto by sending a network message.

3.   The system of claim 2, wherein the network message received by the controller includes a device identifier, which is associated with the device that transmitted the message, and a transport stream identifier, which is associated with a given transport stream, wherein the given transport stream is a transport stream received and monitored by the device associated with the device identifier.

4.   The system of claim 3, wherein the network message includes network information.

5.   The system of claim 3, wherein the multiple devices are further adapted to transmit at least one transport stream, and the network message from each of the multiple devices includes a second transport stream identifier that is associated the at least one transmitted transport stream.

6.   The system of claim 5, wherein the controller determines a unique transport stream identifier for each transport stream transmitted from each of the multiple devices and associates a particular unique transport stream identifier with a particular device of the multiple devices, and transmits a second message to the particular device, the second message including the particular unique transport stream identifier.

7.   The system of claim 6, wherein the particular device responds to the second message by remapping the transport stream identifier of the at least one transport stream transmitted from the particular device to the particular unique transport stream identifier.

8.   The system of claim 7, wherein a second particular device, which receives the transport stream having the particular unique transport stream identifier associated therewith, of the plurality of devices transmits a second network message to the controller, the second network message includes the particular unique transport stream identifier, and the controller associates the first particular device with the second particular device in the transport stream map.

9.   A method of mapping a digital network that includes a plurality of devices that receive and transmit at least one transport stream, the method comprising the steps of:
> grouping multiple devices of the plurality of devices into a plurality of tiers within the digital network; and
> associating a first particular device of a first tier with a second particular device of a second tier of the digital network, wherein the second particular device receives a transport stream transmitted from the first particular device.

10.   A method of mapping a digital network that includes a plurality of devices that receive and transmit at least one transport stream, the method comprising the steps of:
> grouping multiple devices of the plurality of devices into a plurality of tiers within the digital network; and
> associating a first particular device of a first tier with a second particular device of a second tier of the digital network, wherein the second particular device receives a transport stream transmitted from the first particular device.

11. The method of claim 9, prior to the step of grouping, further including the steps of:

transmitting an initiate mapping message to the plurality of devices; and

receiving a network message from the plurality of devices, each network message per device including an output transport stream identifier and a device identifier, wherein the transport stream identifier is associated with a transport stream transmitted by a device associated with the device identifier.

12. The method of claim 11, wherein the step of grouping further includes the step of: using the device identifier included in each of the network messages and a table to group the plurality of devices into tiers.

13. The method of claim 11, wherein each of the network messages further includes an input network stream identifier associated with a second transport stream, which is received by a device associated with the device identifier.

14. The method of claim 13, wherein the input network stream identifier includes a network transport stream source indicator.

15. The method of claim 14, wherein the network transport stream source indicator is a predetermined value for a device that is a source of a network transport stream in the digital network.

16. The method of claim 9, further including the steps of:

determining whether a particular transport stream identifier associated with a particular transport stream transmitted from a particular device of the multiple devices of a given tier is the same as one or more transport stream identifiers associated with other transport streams transmitted from one or more devices of the multiple devices of the given tier;

responsive to determining the particular transport stream identifier is not the same, associating the particular device with the particular transport stream identifier;

responsive to determining the particular transport stream identifier is the same, further including the steps of:

determining a new transport stream identifier for the particular transport stream, wherein the new transport stream identifier is different from other transport stream identifiers associated with transport streams transmitted from the multiple devices of the given tier;

transmitting a remap message to the particular device, wherein the particular device responds thereto by remapping the particular transport stream identifier associated with the particular transport stream to the new transport stream identifier; and

associating the particular device with the new transport stream identifier.

17. The method of claim 16, after the step of transmitting the remap message, further including the step of:

receiving another network message from a second particular device, wherein the second particular device receives the particular transport stream transmitted from the first particular device.

18. The method of claim 17, wherein the second particular device sends the other network message responsive to the first particular device remapping the particular transport stream identifier associated with the particular transport stream.

1   19.   The method of claim 16, further including the step of:

2   associating the particular device with at least one input transport stream identifier,

3   wherein the network message from the particular device includes the at

4   least one transport stream identifier, which is associated with the at least

5   one transport stream received in the particular device.

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1   20.   The method of claim 33, wherein the digital network further includes a plurality of

2   transport stream receivers, which receive at least one transport stream, and further

3   including the step of:

4   receiving a message from multiple transport stream receivers of the plurality of

5   transport stream receivers, each message per receiver including a device

6   identifier and a transport stream identifier, which is associated with a

7   transport stream received by the transport stream receiver.

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1   21.   The method of claim 20, wherein each of the multiple transport stream receivers

2   respond to and initiate mapping message by sending the message.

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1   22.   A method of mapping a digital network, the method comprising:

2   assigning a unique transport stream identifier to each transport stream of a

3   plurality of transport streams, wherein the plurality of transport streams are

4   transmitted from a plurality of devices included in the digital network;

5   associating each assigned unique transport stream identifier with a particular

6   device of the plurality of devices, wherein the particular device transmits

7   the transport stream having the unique transport stream identifier assigned

8   thereto;

9   transmitting to each device of the plurality each assigned unique transport stream

10   identifier associated therewith;

11   receiving a network message from multiple devices of the plurality of devices,

12   each network message including at least one input transport stream

13   identifier; and

14   using the multiple network messages to determine a hierarchy of devices for the

15   plurality devices.

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23. The method of claim 22, wherein the at least one input transport stream identifier is one of the unique transport stream identifiers.

24. The method of claim 22, wherein the step of using the multiple network messages further includes the step of:

associating a first device of the plurality of devices with a second device of the multiple devices, wherein the at least one input transport stream identifier of the network message from the second device includes at least one unique transport stream identifier associated with the first device.

25. The method of claim 22, further including the step of:

prior to the step of assigning, receiving a second network message from the plurality of devices, each second network message per device including an output transport stream identifier.

26. The method of claim 25, wherein the step of assigning further includes the step of:

using the output transport stream identifier included in each second network message from the plurality of devices to assign the unique transport stream identifier.

27. The method of claim 25, prior to the step of receiving the second network message, further including the step of:

sending a mapping initiation message to a second plurality of devices included in the digital network, wherein the second plurality of devices includes the first plurality of devices, and each of the first plurality of devices respond to the mapping initiation message by sending the second network message.

28. The method of claim 27, further including the step of:

determining whether the first plurality of devices is the same as the second plurality of devices; and

responsive to determining the first plurality of devices is not the same as the second plurality of devices, generating an alert message.

1   29.   The method of claim 22, further including the step of:

2   prior to the step of assigning, receiving a second network message from the

3   plurality of devices, each second network message per device including a

4   transmitter identifier associated with the device sending the message.

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1   30.   The method of claim 29, wherein the step of associating further includes the step

2   of:

3   using the transmitter identifier included in each second network message from the

4   plurality of devices to associate each assigned unique transport stream

5   identifier with the particular device that transmits the transport stream

6   having the unique transport stream identifier assigned thereto.

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1   31.   The method of claim 29, prior to the step of receiving the second network

2   message, further including the step of:

3   sending a mapping initiation message to a second plurality of devices included in

4   the digital network, wherein the second plurality of devices includes the

5   first plurality of devices, and each of the first plurality of devices respond

6   to the mapping initiation message by sending the second network message.

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1   32.   The method of claim 31, further including the step of:

2   determining whether the first plurality of devices is the same as the second

3   plurality of devices; and

4   responsive to determining the first plurality of devices is not the same as the

5   second plurality of devices, generating an alert message.

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1   33.   An apparatus in a digital network that receives a transport stream, the apparatus

2   comprising:

3   a port adapted to receive the transport stream, wherein the transport stream has a

4   transport stream identifier associated therewith; and

5   a processor in communication with the input port, the processor adapted to

6   monitor the transport stream identifier and respond to changes thereto by

7   generating a network message.

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34.   The apparatus of claim 33, wherein the network message includes a second transport stream identifier, wherein the second transport stream identifier is the new transport stream identifier associated with the received transport stream.

35.   The apparatus of claim 34, wherein the network message further includes a device identifier associated with the apparatus.

36.   The apparatus of claim 33, wherein the network message is transmitted through the port.

37.   The apparatus of claim 33, wherein the port is a plurality of input ports, each input port of the plurality of input ports receiving at least one transport stream having a transport stream identifier associated therewith, and the processor is adapted to monitor the transport stream identifier of each input transport stream and respond to changes thereto by generating the network message.

38.   The apparatus of claim 37, wherein the network message includes the current transport stream identifier associated with each of the received input transport streams.

39.   The apparatus of claim 33, further including:
        a transmitter in communication with the processor, the transmitter adapted to
                transmit a second transport stream that includes at least a portion of the
                received transport stream; and
        a second port adapted to receive and transmit messages, wherein the network
                message is transmitted through the second port, and the network message
                includes a device identifier associated with the apparatus.

40.   The apparatus of claim 39, wherein the network message includes the current transport stream identifier associated with the received transport stream.

41.   The apparatus of claim 39, wherein the second transport stream has a second transport stream identifier associated therewith, and the processor receives a remapping message from the second port and responds thereto by remapping the second transport stream identifier associated with the second transport stream.

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1   42.   The apparatus of claim 39, wherein the processor receives an initiate mapping

2   message from the second port and responds thereto by sending through the second port a

3   network message having a device identifier associated with the apparatus and the

4   transport stream identifier included therein.

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1   43.   The apparatus of claim 33, wherein the processor receives an initiate mapping

2   message from the port and responds thereto by sending through the port a network

3   message having a device identifier associated with the apparatus and the transport stream

4   identifier included therein.